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This paper identifies the origins of the concept of feedback and its entry into the interpersonal communication literature as a social science variable. It touches on why feedback might be important in interpersonal relations, what it consists of, some of the relevant research, and some possible dangers or misuses. It speaks to how the process of giving and providing feedback increases confidence and reduces uncertainty in interpersonal communication. It provides some suggestions for giving feedback and receiving it. Attached is an appendix of some of the ideas of Norbert Weiner for class distribution and discussion, a list of common defense mechanisms, and three instruments for making applications of the feedback concepts. One is a warm-up on asking for feedback, another is a list of suggestions for providing it, and a third is a PIB (personal improvement blank) for students to reflect on and fill out and return after the session is over. This is seen as a possible one-session class on feedback in interpersonal communication for lower division university undergraduates or community college students. Contains 22 references. (Author/RS)

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by Alton Barbour

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INTERPERSONAL FEEDBACK: ORIGINS AND APPLICATIONS

Alton Barbour

ABSTRACT: This paper identifies the origins of the concept of feedback and its entry into the interpersonal communication literature as a social science variable. It touches on why feedback might be important in interpersonal relations, what it consists of, some of the relevant research, and some possible dangers or misuses. It speaks to how the process of giving and providing feedback increases confidence and reduces uncertainty in interpersonal communication. It provides some suggestions for giving feedback and receiving it. Attached is an appendix of some of the ideas of Norbert Weiner for class distribution and discussion, a list of common defense mechanisms, and three instruments for making applications of the feedback concepts. One is a warm-up on asking for feedback, another is a list of suggestions for providing it, and a third is a PIB (personal improvement blank) for students to reflect on and fill out and return after the session is over. This is seen as a possible one-session class on feedback in interpersonal communication for lower division university undergraduates or community college students.
Key terms: interpersonal communication, relationships, Norbert Weiner, Elwood Murray, cybernetics, positive and negative feedback, entropy, negentropy, personal growth.

WHY DO WE NEED IT?

Start with the idea of an interpersonal effectiveness scale, a continuum running from zero for totally ineffective to ten for totally effective. Imagine that all of us are on the scale somewhere between zero and ten. If you were to score your own effectiveness and place yourself somewhere on that scale, where would it be? Secondly, how would you know that you were there and not someplace else? What information do you have about your interpersonal effectiveness? Who have you gotten it from? And what would be your level of confidence about that information?

A whole host of distinguished scholars have said that we need to have information from others about ourselves if we are to have an accurate concept of ourselves. For example, psychiatrist Karen Horney (1950) found that people who attempted to analyze themselves simply failed to make any observations about themselves that would lead to any insights they weren't already

ready to accept. Some people interpreted their experiences in such a way that they missed the essential point or idea of what had happened. Or they dealt with ideas superficially or closed the door to further investigation. Harry Stack Sullivan (1972), who made an interpersonal communication approach to psychiatry, said that he was amazed how poorly people could recall and describe their own behavior. He said people had enormous difficulty providing accurate self reports. Much of what they reported was irrelevant and immaterial--sometimes approximating 100 percent. He said that a person can't tell you accurately how he behaved in an important situation unless by sheer chance the way that he acted coincided with how he thought he should have acted, which was an uncommon occurrence. He also said that our perceptions are clouded by the difference between our "ideal" self and our "actual" self. We fall short of behaving as we wish, so we distort our self perception in order for it better to fit the "ideal." The message seems to be that we don't accomplish good self assessment, even if we have the best intentions, by simply sitting alone and thinking about how to get better. Our natural defense mechanisms get in the way and interfere with self understanding. So, in order better to understand ourselves, we require information about ourselves from others. And we need it also to improve our relations with others.

Unless we have somehow gotten the peculiar notion that we are faultless and unimprovable, most of us would accept the idea that we are somewhat flawed and fallible, and that that is the common human condition. To be human is to be imperfect and to make errors. That being the case, many of us would like to improve ourselves and become more effective interpersonally. But how do we get better and how do we know we have gotten any better after we have tried to? The answer to all of these questions is that feedback can help us capitalize on what already works favorably for us. And it can let us know what doesn't work so that we can stop doing it or

at least do less of it or do it less often. Feedback can aid self correction, aid self regulation, and increase interdependence with those who can be helpful to us and our personal growth. It can assist us in altering behavior in a positive way. It can increase communication accuracy and it can increase communication confidence in everything that is accomplished. That is, it can reduce uncertainty and better interpersonal understanding. In the words of Alvin Goldberg, feedback is the answer to the question, "How am I doing?" Feedback is at least part of the means by which qualities of relations are improved. Given all of this, what is it, what do we know about it, what are the drawbacks, and what do we need to do in order to take advantage of it?

WHAT IS IT?

There are a couple of answers to the question of what feedback is, and both of them involve further specifics which also require explanation. The first is a technical answer and the second is the answer applied to human interpersonal communication. But the technical answer and the interpersonal answers are not incongruent, and both follow the same principles. I will examine the technical background first. The story begins in post WWII 1948 when MIT professor Norbert Weiner published the first edition of the book, Cybernetics, subtitled, "Control and Communication in the Animal and the Machine." In this book, Weiner discussed some of the concepts and the techniques he believed were of proven value in the physical sciences and technology. He also suggested a program of inquiry intended to extend the application of these same concepts and techniques from the physical sciences to the social and behavioral sciences, and even to society itself.

During WWII, Weiner had been employed by the U.S. government to make "fire control systems" more effective against the speed of enemy jet fighter planes. Rather than extinguishing out-of-control fires as the term seems to suggest, the systems Weiner was working on were anti-

aircraft machine guns mounted on bombers. These machine guns had the capacity to take into account the speed of the aircraft in which the gun was mounted, the speed of the aircraft the gun was pointed at, the movement of the gun, and the speed of the projectiles which were fired, so that they were all part of the same system. What had been happening prior to Weiner's involvement in the project was that the Nazi airforce jet planes (a new technology at the time) were so swift that the Allied bomber gunners were unable to respond to them with any effectiveness. By originating a scheme of correction and adjustment which took the speed and movement of the Nazi plane into account, Weiner had the gun pointed so that the bullets fired converged with the plane they were fired at. This is much like what happens when a skeet shooter fires ahead of or "leads" the clay pigeon he/she is firing at. The Nazi plane flew into the line of fire. The "problem" of plane speed and movement was factored into the fire control system, was accounted for, and was "solved" with feedback.

Weiner's involvement in WWII impressed him with the degree to which electronics, including U.S. Navy radar and sonar had changed the practice of warfare so that it would never be the same again. He thought that some of the answers to technical problems which were found in physical science, mathematics and technology during wartime might be used to influence human conduct in peacetime as well. In Cybernetics, Weiner reformulated many biological and social problems so that they could be conceptualized in engineering terms and made available to mathematical analysis. He approached these biological and social problems in the same way that he had approached the fire control systems problems during WWII. In the years after the war he lectured frequently on the social implications of what he called the cybernetic or second industrial revolution. The difficulty with both the book and with the lectures was that they were so technically dense that they were unintelligible, thus unavailable to even the most intelligent

people in the general population. He was not getting his message across.

Those who knew Weiner urged him to write a considerably less technical book than Cybernetics, in order to reach the intelligent but non-scientific public with his revolutionary ideas. This encouragement resulted in the publication in 1950 of The Human Use of Human Beings, subtitled, "Cybernetics and Society." It is probably one of the most important and influential works on the place of humans in an increasingly automated and technologically advanced world. Comparing his 1950 book with the advance of present day technology, his observations, his warnings, and his suggestions are remarkably prophetic, and for a brilliant and strict empiricist, he was surprisingly humanistic. Possibly the idea or the word "feedback" was known to some few engineers or technicians prior to Norbert Weiner's application of it. But by and large, it was with the publication of The Human Use of Human Beings that the word "feedback" first became available to a more general part of the population and moved from the lexicon of the technician and entered into the language of human behavior. Some of Weiner's observations are summarized and attached in an appendix.

So far as we know, Elwood Murray, who was the Director of the School of Speech at the University of Denver from 1931 to 1962, was the first person to use the word "feedback" applied to human interpersonal communication. He was the originator of the study of interpersonal communication in 1947 and the founder of the International Communication Association (Adams, 1971; Brownell, 1983; Papile, 1979; University of Denver Bulletin, Vol. 48, No 16, 1947, p. 33). Typically on the cutting edge, Murray was in correspondence with Weiner immediately after Weiner's 1948 publication of Cybernetics (Murray, 1977). According to his graduate students, he began writing articles and papers and talking about interpersonal feedback in his interpersonal communication classes at that same time (Lahaie, 2000; Myers, 2000; Pace,

2000). This was before the Shannon-Weaver communication model, originated by two Bell Telephone engineers, was made available in 1949. The Shannon-Weaver model (with the ideas of noise and redundancy) has been used to describe human communication, but its original purpose was to represent communication through wires between two telephones.

At that time also, feedback was a technical term used in radio and electronics to describe how a signal which was fed back into the system which originated it "closed the loop" and fed through it again and affected the system. A common example is the squeal of the auditorium sound system when the speaker stands too close to the microphone. The sound system makes a noise because it keeps amplifying the original signal by bouncing it off of the auditorium wall and cycling it back through the microphone. The problem is too much positive feedback which is solved when the speaker backs away from the microphone. Murray saw feedback as something which occurred between people as well as between microphones and amplifiers. That is, you could have meta messages about past messages which affected future messages. The meta message closed the interpersonal loop and affected future interaction. Murray's use of the term feedback was an attempt to use science to study communication, to make the study of communication more scientific, to borrow a useful term from a fellow discipline, and to make use of an existing metaphor for what he saw occurring in human interpersonal communication. He was remarkably resourceful in adapting the word to his own uses. (See Murray, Phillips & Truby, 1969).

Now the term feedback is in common usage and is assumed by most people to apply exclusively to human communication. The term is so popular and so commonly used in the context of human communication that few are aware now of its origins in radio and electronic engineering or of Weiner's applications of it in WWII. As Murray conceived the term being used

in human interpersonal communication, feedback is the information provided to us about the nature and appropriateness of our past behavior. (See Murray, Phillips & Truby, 1969) It is useful to the degree that it is accurate, specific, and provides receivers with information which they do not already possess. In order to be helpful, the feedback should be objective and should increase the objectivity of the receiver about his/her own behavior. Feedback allows us to "correct" ourselves, to improve our understanding, to alter our behavior based on information about ourselves from the receiver of our messages. Feedback is often confused with disclosure, but they are not the same. Disclosure is information about how you experience yourself. Feedback is information about how you experience someone else.

This description leads next to the differentiation of feedback which is "positive" and feedback which is "negative." The terms are widely misunderstood and misused, even by those in the communication discipline. In this context, the terms positive and negative do not refer to making encouraging or discouraging, or complimentary or uncomplimentary remarks. Negative does not refer to criticism or unfavorable content. Instead, it refers to information which causes the system to change and adapt. Information which informs the system to keep on doing what is it already doing is positive feedback. A common, if homely, example is the water closet on the toilet of a typical American home. The toilet is flushed which empties both the bowl and the water closet rinsing the bowl and keeping it clean. Once the water closet is empty, a valve operating on gravity plugs the bottom of the water closet. At that time, the water closet begins to fill and continues filling until the water reaches a preset mark at the top of the tank, at which time a second valve attached to a float closes and turns the water off. The whole arrangement is a simple servomechanism regulating the flow of water through the tank, and returning it again and again to the predetermined level. Simple, but efficient and effective. When the tank is empty, it "corrects" itself by filling. Gravity provides the energy and the valves are governors which

regulate the system.

A thermostat on the wall of a house is a mechanical device which is designed to operate on negative feedback. If the house cools down, the thermostat switches the furnace on and warms up the house at which point, the thermostat switches the furnace off and the house gradually cools down. The thermostat is regularly "informing" the furnace what to do through negative feedback and the furnace is regularly adapting and changing because of the feedback. In this way, the house maintains a steady temperature within a predetermined range. An automobile cruise control maintains a constant speed based on the same principle. Or imagine a cat sleeping by the fire. You pick it up and move it to a colder part of the house. Within a short period of time, the cat will have moved itself to be near to the fire again and maintain a constant temperature. As an organism, it monitors its condition and adapts to be where it thinks it ought to be, and acts on that motivation.

WHAT ARE THE PROBLEMS?

What are the possible difficulties in giving and receiving feedback? There are several, all of which are associated with general problems in communication such as barriers, defensiveness, misunderstandings, abstractness, ambiguities and equivocation, but I will attempt to try to be brief, and will mention only a few. Some ways of giving feedback make it more acceptable to the receiver. Some people seem to be especially gifted in providing positive and negative feedback and having it accepted. A reverse corollary of that is reported in research done by James Hightshoe (1982) which tells us that if a receiver of feedback is a high dogmatic (scores in the top quartile on Rokeach's D Scale, Form E) he/she will be unlikely to accept any feedback no matter how that information is provided (See also Winer, 1980). So some people can present feedback well and have it accepted, and others won't receive feedback regardless of how it is

presented, and there is the whole range in between. Some typical problems are:

1. Feedback should not be confused with fact. Others don't know what you think or what your intentions are. They can only see your behavior and make interpretations of it. This means that they will make inferences and the inferences may not be totally accurate.
2. Some pairs of feedback givers and receivers engage in collusion. They cooperate in the denial of truthful data because they are both unwilling to take risks. By tacit cooperation, they can minimize mutual threat and remain safe and ignorant.
3. Some givers of feedback engage in "destructive openness" with vulnerable receivers and are brutally frank "for your own good." The result is punishing and harmful. Both givers and receivers need to monitor vulnerabilities and harmful intentions and close down the exchange if damage or exploitation is occurring.
4. We need to be selective in the feedback we receive. Just because a person says something doesn't make it accurate. We don't have to take feedback from everyone. Some people will give feedback in such a way that it is more acceptable, and more useful than others. Even with those who could be most helpful to us, we don't have to take all of the feedback they provide. Even the best of people have lapses. So we need to be selective, to sort through what is said and decide what to accept and what to reject.
5. There is a misunderstanding that it is easy to take complimentary information and difficult to take unflattering information. Actually, they are both difficult to take. People have a lot of difficulty in receiving positive information about themselves, particularly if it doesn't fit with their self image. With both kinds of feedback, we have to lower our defenses temporarily and let the information through so we can examine it, and see if we can accept it.

AN IMPORTANT INTERVENING VARIABLE

It is difficult to make very many statements about "human nature" which appear to apply to different people across time and in various situations, but there are a few. A variety of schools of psychology (See Combs & Snygg, 1959; Krech, Crutchfield, & Ballachey 1962) tell us that virtually all humans have a basic need or motivation, which is to maintain and enhance a sense of self. This includes being unthreatened and secure, and development away from control and toward autonomy. You might look upon this as what each person goes through while growing up. And it continues to be a motivator throughout our lives. If we want to understand another person, the best way to understand that person is from that person's own frame of reference. If you can, even for a brief time, view things from another person's point of view, you will discover that he/she is more or less constantly engaged in self protection, self preservation, and

maintaining and enhancing a sense of self. One way to go about this self protection is to reject information we get about ourselves which is incongruent in any way with how we already see ourselves. One might say that it is instinctive to do so. It is natural to protect oneself from threats, attacks, and dangers. In fact, people who have never learned how to protect themselves or to sustain themselves in difficult times are unable to cope with dangers and become eternal victims. But that is not true for the most of us. Most of us have learned very well how to defend, protect, and sustain ourselves. We do it easily and well. We are experts at taking care of ourselves. We do it in the face of actual threats, we do it against imagined threats, and sometimes we do it against no threats at all. In protecting ourselves we save ourselves from possible injury, but at the same time, by protecting ourselves we can become less healthy and less able to grow.

Our current conceptions of defense mechanisms had their origin in 1895 when Sigmund Freud first used the term "repression" to describe unconsciously motivated memory loss in what he termed "hysterical" patients. By 1926, thirty years later, he was stating that defense mechanisms were all protective devices used by the ego against "instinctual demands." Anxiety was given a central position in Freud's thinking as a cause rather than an effect of defensive behavior. Generally speaking, defensive behavior included any thinking or feeling designed to shut out an awareness of something unpleasant, shameful, anxiety-arousing or threatening to the sense of self (See Hinsie & Campbell, 1975). Defensiveness is a normal, if sometimes negative part of everyone's behavior. It is not possible or even advisable to eliminate defenses. They make the world more predictable and allow us to remain safe when something happens which is contrary to our expectations. At the same time, they block our learning, causing us to make the same mistakes over and over again. They blind us to our faults. They constrict our perceptions and

experiences. They shield us from information which could help us if only we could receive it. In protecting ourselves, we can end up becoming virtual prisoners of our own protection. A list of common defense mechanisms is attached in the appendix.

What are some behaviors which evoke defensive behavior? Although there are numerous specific ones, there are just a few larger categories. They are: 1.) Evaluation: A description of someone with information of an evaluative nature such as good-bad, better-worse, right-wrong, praise-blame, or positive-negative. Carl Rogers has said that even a positive evaluation is still an evaluation. 2.) Attempts to control: Attempts to impose your will on someone, to alter the person in some way, to persuade, offer advice, change attitudes or behavior. 3.) Implied superiority: Any message which suggests that "I am better than you," or "I am more than you," which also suggests "You are not as good as I am," or "You are less than I am because of position, wealth, age intellect, training, experience, or morals." 4.) Certainty: This is another term for dogmatism. It describes a person who is always right, needs to win every argument, whose ideas are truths not to be challenged. 5.) Strategy: This would include manipulation, gimmicks, tricks, games, maneuvers or other various dealings in which the receiver begins to believe that the interaction involves deception. 6.) Neutrality: This would involve interactions in which one party was clinical, detached, uninvolved, and apart from it all. There would be evidence of a lack of investment, a lack of affect, a lack of concern, a barrier of distance. Although this is not a category, it probably should be mentioned that accusing someone of being defensive might make that person defensive, even if he/she wasn't originally. The statement is a judgment, an evaluation, and judgments and evaluations can make people defensive. It is important to note that if someone holds a different point of view in opposition to yours, it is not necessarily because of defensiveness on that person's part.

Finally, in dealing with this variable it should be noted that there is an accumulation of empirical data (Wells & Marwell, 1976) which tells us that that there is a direct but inverse relationship between defensiveness and self esteem. As self esteem increases, defensiveness decreases. If you are coming from a position of strength, power, security and self sufficiency, it is easier to admit to weaknesses and to attempt to improve on them. If you avoid or deny them, they stay the same. People are much more inclined to avoid or deny or hide weaknesses if their esteem is low. People who need the most help prevent themselves from getting that help by shutting it out.

Health implies change and growth. In a lecture at the University of Colorado Health Sciences Center, Nobelist Konrad Lorenz (1974) said, "In a healthy environment organisms tend to increase the extent of their excursions. In an unhealthy environment, a threatening one, they restrict the extent of their excursions." Defensive behavior occurs naturally whenever the organism feels threatened. An organism in a defensive posture in a threatening environment does not increase the extent of its excursions and does not grow. Logically then, growth does not occur in threatening environments, but in healthy nurturing environments. Since we are rarely threatened physically, we are usually defensive about psychological threat, threats to our egos, particularly in the areas of esteem and belongingness. Ideally then, in order for feedback to do the most good, it should occur in a healthy environment and when defensiveness is at a minimum. Given all of this, feedback should be given in a way which reduces defensiveness and minimizes the potential for damage and exploitation?

HOW DO WE GO ABOUT IT?

The essential idea behind feedback is that it is all goal-oriented, even if the goal is limited or when the goal is dynamic. A second idea is that there must be movement in the system, whether

it is fast or slow. In order for feedback to work in helping the system achieve its goal (s), the system can never rest for long. What happens when feedback operates is that the mechanism (or organism) registers its actual state in the system. It then compares that actual state with its desired state. It uses the comparison between the actual state and the desired state to make a correction. The mechanism (or organism) then responds so as to move from the actual state to the desired state. A couple of examples are in order. Consider a ship leaving a port and travelling across the ocean to another port. It knows where it is and it knows where it wants to be. But sailing a ship is not like driving a car on a highway. There are other intervening influences. While the ship is underway, because of the rotation of the earth and the movement of the moon, there will be tidal changes in the ocean which affect the movement of the ship. There will also be currents and winds which do the same. And there may be storms which do the same, and all of these different influences are likely to be going in different directions. This results in what is called "set and drift" which push the ship off course. In response to all of these different influences the navigator of the ship will have to monitor where it is and where he/she wants it to be and will have to alter its speed and heading on a regular basis in order to stay on course.

Or consider the tightrope walker you see in the circus. She leaves the safety of her pedestal for the danger of the wire forty feet above the floor. She knows where she is and where she wants to go. She stops and achieves balance by lifting one foot. It is easier to balance on one foot than two. But she cannot walk with one foot off of the wire. So she puts her foot down and starts forward. But with one foot in front of the other, she is unstable and at risk, so she stops again and achieves balance by lifting a foot. Her progress across the wire is a combination of alternatingly achieving balance and then moving forward until finally she is at the pedestal at the other end and in safety again, her goal achieved. Given all of this, how can we help a person

achieve increased accuracy, increased confidence, self regulation and self correction in interdependence with another human being?

An important feedback investigation by London, Larsen, and Thisted (1999) studied employees in a Danish bank. It examined how feedback might be related to self development within the organization. Employees rated the feedback they received, and supervisors rated the employees' self development. Feedback consisted of both evaluation and encouragement. Feedback which resulted in feelings of "empowerment" was most effective. Employees who felt empowered through the feedback they received tended to contribute most to the organizational performance. Younger employees were most likely to seek out feedback. Feedback in this setting could be shown to affect both self development and organizational performance.

Sometimes we find that important ideas in the social and behavioral sciences have already been identified and described by someone in the arts and humanities. As with many other ideas, this is true with the concept of feedback. The Scottish poet Bobby Burns (1857) wrote:

> O would such power the giftie gie us,
> To see ourselves as others see us,
> It would from many a blunder free us,
> And foolish notion.

For the Scots of the 1800s, the "giftie" was a Santa Claus type figure who left presents. In the poem, the present would have been accurate self perception and appraisal. Even now it would be wonderful if the giftie would come around and save us from errors of misperception and other "foolish notions," but in this current time and space we still have no giftie to do that for us. Interpersonal feedback, however, honestly solicited and appropriately given and properly acted upon can provide us with more accurate self concepts, can reduce uncertainty and misunderstandings, and can improve our relations with others. For Norbert Weiner, feedback was the answer to some global issues and societal problems. For Elwood Murray, feedback

provided a key loop in an interpersonal communication model and was highly practical on the personal level. Weiner and Murray may be the closest we will ever come to having gifties. We owe them both a debt of gratitude for having the foresight to see how this scientific principle could become a useful tool in the service of social and self improvement. Attached in the appendix is a list of recommendations for providing feedback.

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APPENDIX
TWELVE IDEAS ON FEEDBACK FROM NORBERT WEINER FOR CLASSROOM DISCUSSION

First some background material about Norbert Weiner. Why should we believe what he might have to say about the greater context for understanding feedback? Weiner was educated at Tufts and at Harvard University where he received his undergraduate degree at the age of fourteen. He also graduated from Harvard with a Ph.D. at the age of eighteen, when most young people are just finishing high school. He later studied at Cornell and Columbia in the U.S., Cambridge in the U.K. and in Copenhagen in Denmark and Gottingen in Germany. He joined the mathematics faculty at MIT in 1919 where he served until his retirement in 1960. Throughout his life he received international honors for his academic achievements. He often represented the U.S. at international scientific conferences.

In a technologically advanced society, in the complex organizations within that society, and in our daily lives, we are increasingly faced with the interface of technology and humanity, the problem that Weiner described. And for which he proposed answers from the concepts and techniques of proven value in the physical sciences and technology. Technology has the potential for dehumanizing us. At the risk of oversimplifying and possibly distorting some information, following are some summaries of his ideas which may be useful to think of in the context of goal accomplishment, interpersonal appraisal, and feedback.

1. Newtonian physics, which ruled the world from the end of the seventeenth century to the end of the nineteenth century without a word of opposition, describes a deterministic universe in which everything happens precisely according to law. This would be a compact and tightly organized universe in which the whole future depended upon the whole past in clear and direct cause-effect relationships. That is no longer the dominating view of the new physics, which is now more relativistic, uncertain, and unpredictable.
2. In this new relativistic (Einsteinian), probabilistic (Heisenberg) universe, the probability is that entropy will increase as time passes. Entropy is a term borrowed from thermodynamics or the science of heat. In that context, it is the formal statement of the tendency for a closed system to deteriorate, to run down, and to lose energy. This would also include the tendency for going from a highly differentiated, highly organized state to an undifferentiated and chaotic one. So increased entropy could be described as the tendency of a closed system to grow gradually more chaotic and disorganized. Still another way to say it is that left to its inevitable destiny, everything will gradually run down and fall apart.
3. Weiner originated the word "cybernetics" because there was no existing word for the complex of ideas he wished to deal with. It is derived from the Greek word *kubernetes* or "steersman." The word is intended represent the combination of communication and control in a theory of messages. Control was to be accomplished through the use of feedback. Information is the name for the content of messages which are exchanged. In communication, we are always fighting nature's entropic tendency to downgrade the organized and destroy the meaningful. Why? Messages are themselves a form of pattern and organization. If they are not organized, they don't make sense. Also, if a message is passed on, distributed, or transferred a number of times, there is a tendency for it gradually to become distorted, less clear, less accurate, less effective. Think of a photocopy of a photocopy of a photocopy, etc. Each time a copy is made of a copy, there is less clear and reliable information. The information carried by a message is essentially the negative of its entropy or negentropy. Entropy is a measure of disorganization of a message. So,

negentropy is a measure of the organization of a message. Cybernetics also takes the view that the structure of an organization or machine or organism is the index of the performance that can be expected from it. One does not structure an organization one way and then expect it to do something else. One does not expect the same thing from a simple structure as from a complex one or the same from an immature structure as from a mature one.

4. The control of a machine such as an elevator on the basis of its actual rather than expected performance is known as feedback and is accomplished by monitors. The same thing occurs in the locks on the Panama Canal, although more elaborately. The monitors, whether on the elevator or Canal, control the mechanical tendency toward disorganization and produce a temporary and local reversal of the normal direction of entropy. We do the same thing when we drive a car down the road and avoid swerving too far to the right or left. This avoidance of swerving depends on the actual performance of the car. Allowed to take its normal course, entropy would eventually have the car going off of the road. Feedback keeps the car on the road and centered. Monitoring the current status of the car and adjusting by means of feedback are attempts to control entropy. Feedback is the property of being able to adjust future conduct by past performance.
5. Within a physical world, doomed to cool and die eventually because of entropy, there are enclaves in which organization and information are being built up, and where entropy does not increase. Imperfect and temporary as they are, these are enclaves of living beings and machines. Life-imitating machines resemble human beings in representing pockets of resistance to entropy. They allow us to "swim upstream" for a while against the entropic process. The nervous system (sympathetic and parasympathetic) and the automatic machine are fundamentally alike in that they govern future activity based on present activity. The individual nerve fiber "decides" to fire or not just as the simplest mechanical devices make "decisions" between two alternatives such as the opening or closing of a switch.
6. In the ant community each worker performs its proper and specialized functions and only those. If humans were to adopt this ant community as a model, they would live in a fascist state, in which each individual is conditioned from birth for his/her occupation and only that. It is possible to discard the advantage that humans have over ants and organize an ant state with human material. But if a human is restricted to performing the same specialized task over and over again and only that, as an ant does, he/she will not end up being a very good human. Humanlike machines, however, can perform those routine and repetitious tasks like very good ants.
7. Effective behavior, in the sense of goal accomplishment, must be "informed" by some sort of feedback process which tells the goal seeker whether he/she has equaled the goal, surpassed the goal, or fallen short. The simplest kinds of feedback deal with gross success or failure. They inform whether something has been accomplished or not. They amount to a simple yes or no. There are, of course, much more elaborate and subtle varieties of feedback. Feedback enables the accomplishment of goals with a minimum of wasted time and energy. Feedback makes for efficiency in achieving goals and is therefore economical.
8. There is no doubt that other animals, and even insects, communicate. That which distinguishes human communication from the communication of all other organisms is in the complexity of the symbolic code, and its high degree of arbitrariness. There is no inherent connection between the symbol (the word or combination of sounds or representation) and the thing symbolized except in the human mind. The signal systems of animals and insects are fixed by species and unchanged in known history. Humankind's capacity for language is

apparently a potential which is built in or "hardwired" in humans and is not hardwired in our nearest relatives, the great apes. Speech is a peculiarly human activity. Very intelligent chimpanzees, raised among humans, persist in being perfectly good chimpanzees instead of quasi-humans. Our facility with spoken and written symbols allows us to provide elaborate and sophisticated feedback, but the abstractness of human language also allows for greater possibilities of misunderstanding.

9. According to Jacob Bronowski, mathematics, which is another arbitrary and complex human symbolic code, is also the most colossal metaphor imaginable. But that's hard to imagine.
10. Matter can be conserved. Whereas it is possible to conserve gold by storing it, it is difficult to conserve information. Information is less "stable." Just as entropy tends to increase spontaneously in a closed system, information tends to decrease; entropy is a measure of disorder. Information is not well suited to being a commodity or a property. A good commodity must have a reliable value and an active group of buyers competing for it. All it takes for information to become less valuable is a depression in the market, a lack of competition, an alternative attraction, or a lapse in time. Consider the possibility of storing scientific information. What value will it have in a world in which scientific discovery is constantly advancing? What is the value of last week's gossip, yesterday's news? Tactical information is obsolete within hours. Information is more a matter of process than of conservation and ownership.
11. According to Weiner, to be alive is to participate in a continuous stream of influences from the outer world and to act on the outer world in which we are merely the transitional stage. To be alive to "what is happening in the world" means to participate in a continual development of knowledge and its unhampered exchange.
12. The fundamental internal evil within the modern mass communication industry, because of the complexity and cost of delivering their services, is that they have mastered the craft of saying less and less to more and more. It is paralleled with an internal cancer which is creative narrowness and feebleness. The product is standardized, and being so tends to be unimaginative, predictable, bland, and aimed at the lowest common denominator.

What can we get from these ideas of Weiner which might be helpful to us in the context of appraisal, goal setting, self evaluation and personal growth? Let's consider just a few. Entropy is a natural process in a closed system which drains energy, destroys, downgrades, and disrupts. That is true throughout the universe and there is no reason to believe that it is different here at this time on Earth. Feedback is possible among living creatures and some machines. Intentional systematic feedback allows us locally and temporarily to resist and overcome the effects of entropy and accomplish goals such as work or growth. A "steersman" at the helm of a boat is a marvelous metaphor for what feedback does in repeatedly altering the course to arrive at the destination. Feedback involves the adjusting of future performance by monitoring past behavior and current status. By doing the same, we can "sail against the wind" and against the inevitable entropic process. When we do so, we are more orderly, we increase our effectiveness in achieving our goals because we can move forward toward them with a minimum of wasted time and effort. Feedback increases organization and reduces error in a chaotic world. It is, in Weiner's words, negentropic. The use of feedback then, is both efficient and economical. In order to make it work effectively we must look upon information as a process rather than a commodity. Instead of being stored and conserved, information must be current and be used.

SOME COMMON DEFENSE MECHANISMS

Defensiveness is an adjustive reaction, typically habitual and unconscious, to protect oneself from anxiety, guilt, or loss of esteem.

1. Compensation: developing strength in one area in order to offset weakness in another.
2. Denial: refusing to accept the existence of threatening facts.
3. Disassociation: keeping conflicting attitudes and impulses apart.
4. Displacement: transferring emotional reactions from one object to another.
5. Idealization: overestimating the character or abilities of another.
6. Incorporation: "taking in" the qualities of another person and making them a part of the self.
7. Intellectualization: concealing feelings through a concentration on intellectual activity.
8. Projection: shifting blame or faults to another person.
9. Rationalization: providing reasons to offset disappointment or justify behavior.
10. Reaction formation: going to the opposite extreme to compensate.
11. Regression: reverting to previous familiar, safe, comfortable behavior.
12. Repression: excluding painful or threatening experiences from consciousness.
13. Sublimation: finding (substituting) acceptable expression for unacceptable drives.
14. Undoing: counteracting guilty impulses or behavior with acts of atonement.
15. Withdrawal: retreat from threat, sometimes including retreat from reality.

ASKING FOR FEEDBACK

Directions: Make notes for yourself in response to the following four items, then follow the action directions on the reverse side of the page.

1. REFLECTION: If you are honest with yourself, what concerns, questions, or decisions confronting you are you curious about and would you most appreciate viewing from the perspective of others? Make a list.

2. What about yourself are you most uncertain of or know least about, that you would like to know more about. What would you like clarification about? Be honest with yourself. Consider more than one thing. Make a list.

3. Of all of the people with whom you are familiar in this room, whose opinions do you most value? List three of four possible people. Do not rank order them. If you are uncertain of the name, use a brief description.

4. Assume that it is possible that others in the group might have listed you as someone whose opinion they value. If someone came to you and asked for feedback, do you think that you would be able to be clear, direct, and supportive? What might prevent your being so?

Alton Barbour, University of Denver, 2003

5. ACTION: When you are told to by the instructor, walk around the room checking out the people you have listed in item 3. Let them know that you have listed them. Ideally, you would do this until you found someone who also has your name on his/her list. You may not get your first choice, nor may that other person. If all of the people you have chosen are taken, wait until one is available, choose someone else who is acceptable, or see if it possible to join a couple making it a triad. Sit down together and see if you can ask for and provide feedback for one another. Choose your own comfort level. See if you are able to follow the directions for providing feedback.

SOME SUGGESTIONS FOR PROVIDING FEEDBACK

Feedback is not advice. It is a description of how one person experiences another person. It is a way of helping a person understand more about him or herself. It is communication of a particular kind to a person about how that person is perceived by or affects others. Based on feedback, a person may consider changes that he/she would not have considered otherwise. It can help that person achieve goals or improve relations with others. So, in that sense, it is a gift. But it is not always easily given or received. How can it given in a way that is helpful?

Some criteria for useful feedback:

1. It is descriptive rather than evaluative. If you describe your own responses, it leaves the other person free to use the feedback as he/she sees fit. If you avoid evaluative language, you reduce the need for the other person to react defensively.
2. It is specific rather than general. To be told that you are "dominating" is not as useful as being told that, "Just now when we were trying to decide the issue, you did not listen to what the others said and I felt forced to accept your arguments or face personal attack."
3. It takes into account the needs of both the giver and receiver. Feedback can be destructive when it serves the needs of one and not the other. Feedback "for your own good" probably serves the needs of the giver but not the receiver.
4. It is directed toward perceptions and behavior that the receiver can do something about. Frustration is only increased when attention is called to a perceived error or flaw that the person has no control over.
5. It is solicited rather than imposed. Feedback is most useful when the receiver him/herself has formulated the kind of question which observers can answer. It is evidence that the feedback is wanted.
6. It is well timed. In general, feedback is most useful at the earliest opportunity after the behavior in question. This is dependent, of course, on the person's willingness to hear it. The evidence is that feedback is more effective when it is immediate.
7. It is checked or verified to ensure clarity. One way of doing this is to have the receiver rephrase and repeat the feedback to see if the understanding corresponds with what the sender had in mind.
8. It is verified through consensus. When feedback is given in a class or training group, both the giver and receiver have the opportunity to check their perceptions with others in the group to ensure accuracy and reliability. Is one person's perception shared by others?

Feedback is a way of giving help and getting help. It is a corrective mechanism for an individual who wants to learn how his/her behavior matches his/her intentions. It is a way for confirming one's identity through the requested appraisals of others.

Alton Barbour
University of Denver
2000

PERSONAL IMPROVEMENT BLANK

1. How can feedback 1.) help us capitalize on what already works for us and, 2.) let us know what doesn't work so we can either stop doing it or improve on it?

2. What do you find it most difficult to take feedback on? In what areas are you most prone to block it out or resist it?

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